

dards, and which further involve a high cost in comparison with the glass devices owing to the material used.

Finally, a device having a casing of plastics material is known from Italian patent no. 1300229. This device has never been marketed, however, since it is not suitable for withstanding high temperatures, such as, for example, those reached by the device should it remain live out of the water, at which temperatures the plastics material softens. It is possible to overcome this disadvantage by producing the casing from heat-resistant plastics materials, such as thermo-resistant resins, which have the disadvantage, however, of high cost.

#### Description of the invention

The problem addressed by the present invention is to provide an immersion heater device for aquariums and the like which is structurally and operationally designed to overcome the limitations set out above with reference to the prior art cited.

This problem is solved by the present invention by means of an immersion heater device for aquariums and the like which is produced according to the claims below.

#### Brief description of the drawings

The features and advantages of the invention will be better appreciated from the description below of one preferred embodiment which is illustrated purely by way of non-limiting example with reference to the appended drawings, in which:

- Fig. 1 is an exploded view of an immersion heater device produced according to the invention;
- Fig. 2 is a perspective view of the heater device of Fig. 1;
- Fig. 3 is a sectioned side view of the heater device of Fig. 1;
- Fig. 4 is a sectioned view to an enlarged scale of a detail of the heater device of Fig. 1.

#### Preferred method of carrying out the invention

With reference to the Figures, an immersion heater device for aquariums and the like which is produced according to the present invention is generally indicated 1.

# CLAIMS

1. Immersion heater device for aquariums and the like, comprising a casing (2) which contains a heating element (6), characterised in that the casing, at least in the region of a radiant zone of the heating element, comprises a layered structure having at least one layer (8) of metal material and one layer (9) of plastics material, wherein the layer of metal material is interposed between the heating element and the layer of plastics material.
2. Heating device according to claim 1, wherein the layered structure comprises a layer of insulating material (21).
3. Heating device according to claim 1 or claim 2, wherein the layer of plastics material (9) and the layer of metal material (8) are in contact with each other.
4. Heating device according to claim 3, wherein the layer of metal material and the layer of plastics material completely surround the heating element.
5. Heating device according to claim 4, wherein the layer of metal material (8) and the layer of plastics material (9) constitute a continuous wall.
6. Heating device according to claim 5, wherein each of the layer of metal material and the layer of plastics material is in the form of a cylindrical tubular element, the layer of plastics material (9) being closed at one end and open at an axially opposite end.
7. Heating device according to any one or more of claims 2 to 6, wherein the layer of insulating material (21) is interposed between the layer of metal material (8) and the heating element (6).
8. Heating device according to any one or more of the preceding claims, wherein the layer of metal material (8) is produced from aluminium.
9. Heating device according to any one or more of the preceding claims, wherein the layer of plastics material (9) is produced from resin reinforced with glass fibre.
10. Heating device according to claim 9, wherein the resin is polyamide.
11. Heating device according to any one or more of claims 2 to 10, wherein the layer of insulating material (21) is produced from mecanite or ceramic material.
12. Heating device according to any one or more of the preceding claims, wherein the casing (2) comprises a second tubular element (10) which is con-

nected to a first tubular element (3) having the layered structure, the second tubular element defining two axially opposite ends (10a, 10b) which are both open.

13. Heating device according to claim 12, wherein the second tubular element is mechanically connected, with sealing means being interposed, to the first tubular element (3) having a layered structure.

14. Heating device according to claim 13, wherein the mechanical connection means between the tubular elements are of the permanent type.

15. Heating device according to any one or more of claims 12 to 14, comprising a thermostat (13) for regulating the temperature of the water of the aquarium, which thermostat (13) is housed in the second tubular element (10).

16. Heating device according to any one or more of claims 12 to 15, wherein the second tubular element (10) is produced from transparent plastics material.

17. Heating device according to any one or more of the preceding claims, comprising means for limiting the temperature by interrupting the energy supply to the heating element (6) in the event that the temperature of the casing (2) exceeds a pre-set limit value.